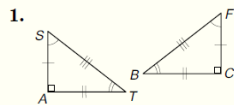
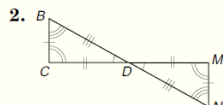


# Isosceles Triangle Theorems

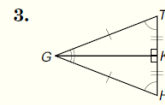
Complete each correspondence statement.



$$\triangle SAT \cong \triangle \text{FCB}$$

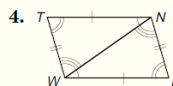


$$\triangle BCD \cong \triangle \text{NMD}$$

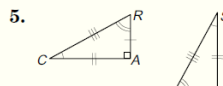


$$\triangle GHK \cong \triangle \text{GTK}$$

Write a congruence statement for each pair of congruent triangles.



$$\begin{aligned} \triangle TWT &\cong \triangle IWT \\ \triangle WTN &\cong \triangle IWN \\ \triangle TNW &\cong \triangle IWN \end{aligned}$$



$$\triangle ARC \cong \triangle OVS$$



$$\triangle FEM \cong \triangle GKM$$

Draw triangles  $\triangle EDG$  and  $\triangle QRS$ . Label the corresponding parts if  $\triangle EDG \cong \triangle QRS$ . Then complete each statement.

7.  $\angle E \cong \angle \text{Q}$

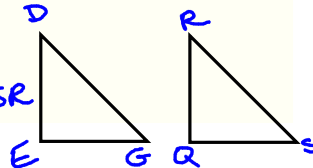
8.  $\overline{DG} \cong \overline{\text{RS}}$

9.  $\angle EDG \cong \angle \text{QRS}$

10.  $\overline{GE} \cong \overline{\text{SQ}}$

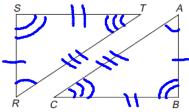
11.  $\overline{ED} \cong \overline{\text{QR}}$

12.  $\angle EGD \cong \angle \text{QSR}$

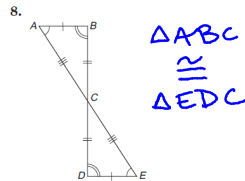
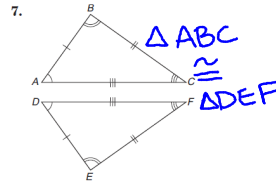


Label the corresponding parts if  $\triangle RST \cong \triangle ABC$ . Use the figures to complete each statement.

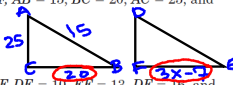
1.  $\angle C \cong \underline{\angle T}$
2.  $\angle R \cong \underline{\angle A}$
3.  $\overline{AC} \cong \underline{\overline{TR}}$
4.  $\overline{ST} \cong \underline{\overline{CB}}$
5.  $\overline{RS} \cong \underline{\overline{AB}}$
6.  $\angle B \cong \underline{\angle S}$



Write a congruence statement for the congruent triangles in each diagram.

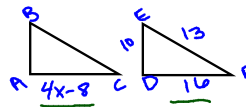


9. Given  $\triangle ABC \cong \triangle DEF$ ,  $AB = 15$ ,  $BC = 20$ ,  $AC = 25$ , and  $FE = 3x - 7$ , find  $x$ .



$$\begin{aligned} 20 &= 3x - 7 \\ +7 &+7 \\ 27 &= 3x \\ x &= 9 \end{aligned}$$

10. Given  $\triangle ABC \cong \triangle DEF$ ,  $DE = 10$ ,  $EF = 13$ ,  $DF = 16$ , and  $AC = 4x - 8$ , find  $x$ .

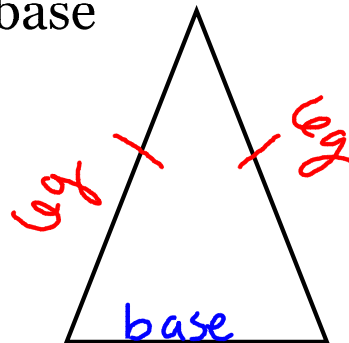


$$\begin{aligned} 16 &= 4x - 8 \\ +8 &+8 \\ 24 &= 4x \\ \frac{24}{4} &= \frac{4x}{4} \\ x &= 6 \end{aligned}$$

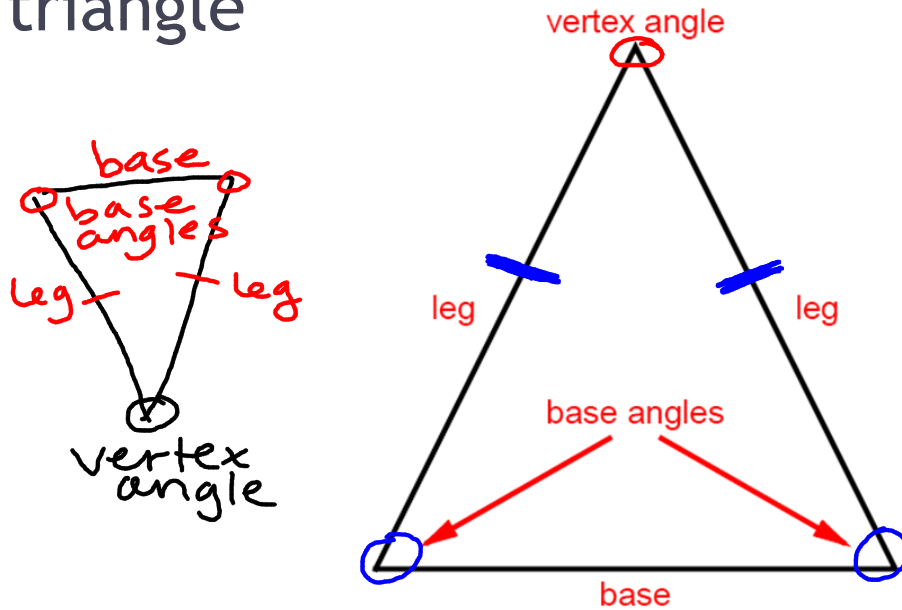
What is an isosceles triangle?

As we discussed in a previous section isosceles triangles are triangles with at least two sides congruent.

The two congruent sides are called legs and the third side is called the base



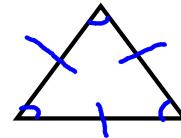
# Examining the parts of an isosceles triangle



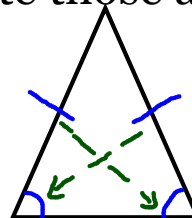
## The Isosceles Triangle Theorem

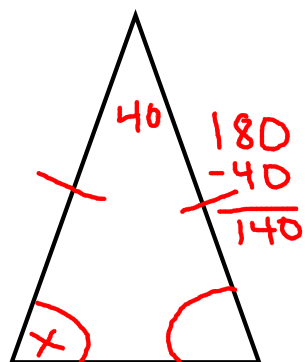
If two sides of one triangle are congruent, then the angles opposite those sides are congruent.

- Corollary 1: An equilateral triangle is also equiangular.
- Corollary 2: An equilateral triangle has three  $60^\circ$  angles.
- Corollary 3: The bisector of the vertex angle of an isosceles triangle is perpendicular to the base at its midpoint.



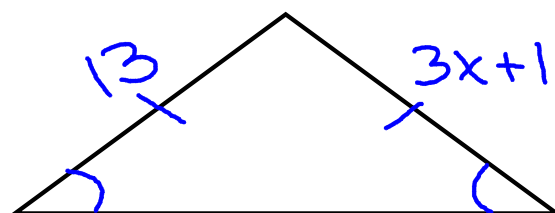
The converse: If two angles of a triangle are congruent, then the sides opposite those angles are congruent.





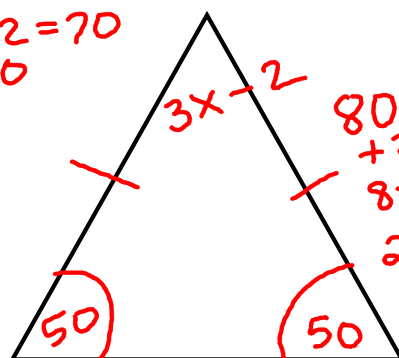
$$140/2 = 70$$

$$x = 70$$



$$13 = 3x + 1$$

$$\begin{array}{r} -1 \\ 12 = 3x \\ \hline 4 = x \end{array}$$



$$80 = 3x - 2$$

$$\begin{array}{r} +2 \\ 82 = 3x \\ \hline 27.\bar{3} = x \end{array}$$